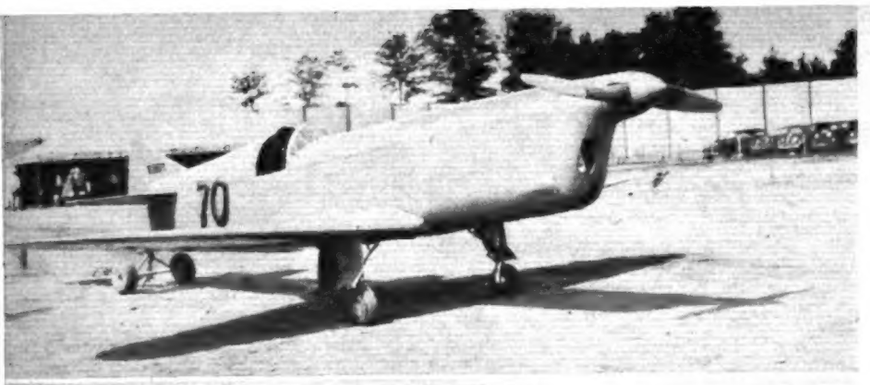

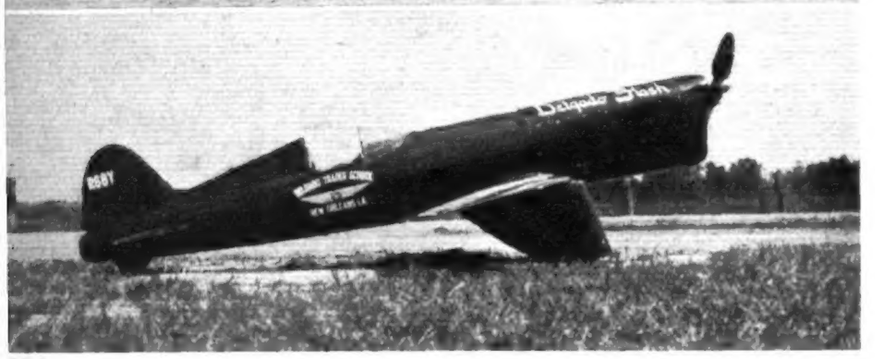

C. H. Gotch's Keith-Rider Special (top) and the Delgado, both of which have small Menasco in-line engines. The Delgado, built by students, is comparable with our T.K.4.

The second place winner of both the Thompson and Bendix races was Earl Ortman's re-vamped Keith Rider. This plane was originally built for the MacRobertson Race, but on one of its trial flights it nosed over, killing its pilot, Jim Granger, and since then has been rebuilt twice. A two-row Pratt and Whitney Twin Wasp Junior now powers the craft, and had not Ortman gone into a coma from the oil fumes and high altitude he might have easily won the Bendix Race. Though this plane is a long-distance ship it was entered in closed-course competition and did very well considering. When the tail of the all-metal fuselage is filled to capacity with oil it takes about seven men to lift it, the ship being so heavy. Forward of the cockpit enclosure are tanks holding 240 gallons, which is just about enough for a speedy flight of 3,000 miles from Los Angeles to New York. Howard Hughes used only 200 gal. on his seven-hour flight for that distance. That is, of course, a very low fuel consumption for such a large engine (also a Twin Wasp Junior) but at lower altitudes in closed-course racing where the engine does not produce its maximum output and is not in rarefied air the story is different. However, the Keith Rider clocked 263 m.p.h. in its qualifying race for the Thompson Trophy Race and had plenty of fuel for the 200-mile grind.

Speed-polishing

The wing and tail surfaces of the Rider, except for metal fin, are wood with plywood covering, over which is silk material to give a very smooth surface. The entire plane is painted black, and at times, as on many of the racers, the leading edge of the wing is gone over with emery paper to get the maximum of smoothness from the paint job and thus a few more miles per hour. On all the racing ships skin friction drag has been well taken care of by the use of well streamlined shiny surfaces.

The Ortman plane broke precedent by having a flapped cowl, which is a very helpful device for racers. Their engines are usually driven full out all the time, so, obviously, cooling is one of the most important items in the design of modern racing craft. The engines are very temperamental, and a cooling device that may be adjusted in the air as desired may mean the difference of the losing or winning of a race.

Col. Roscoe Turner, after much difficulty in preventing his new sleek racer from blowing apart at the various stopping points on the way to the Races, finally arrived on the last day after a mad speed dash averaging 333 m.p.h. from Albuquerque to Cleveland. Apparently his engine trouble had been overcome! While Ortman had a low-wing racer, Col. Turner's was of the mid-wing variety with a surface so smooth that it was impossible to discern its construction. However, without any possibility of doubt, it is plywood-covered with a sheet-metal leading edge. The fuselage is a wood-and-metal-framed structure covered exceedingly well with fabric. Up in front is a 1,200 h.p. Pratt and Whitney T..in Wasp engine turning a three-bladed propeller. One of the most surprising features is that it has a fixed landing gear. Turner's craft is the ultimate in streamlining and is slightly faster than Ortman's steed.

The speed demon of the Races, however, was Steve Wittman, who turned the laws of aerodynamics upside down when he flew his two old racers like they had never been flown before to break all sorts of speed records and beat everything in the field. His old Curtiss D-12-powered racer was the fastest plane at the meet. It is not a racer with a bullet-like appearance, but has an odd shape with a fuselage of simple steel-tube construction and a very thin wire-braced wooden two-spar wing, fabric-covered. This ship was placed second in the Thompson Trophy Race two years ago, and at that time it had a Ford automobile leaf spring across the belly of the fuselage, to which the main landing gear was attached and acted splendidly as a shock absorber. However, the plane turned into a large "barn fire" on its way out to participate in the 1936 Races and was completely rebuilt this year. This time the entire landing gear consists of one solid piece of sheet metal about $\frac{3}{8}$in. thick bent down from the fuselage with a small wheel on each end. Though simple and inexpensive, it makes a good landing gear with excellent shock-absorbing qualities. Its weight also, perhaps, serves as a keel for the ship! And certainly nothing could be better for perfect streamlining. Another very novel feature of the plane is the large prop spinner, inside which is a series of blades forming a fan to blow air into the radiator, which has the same diameter as the spinner. In the nose of the spinner is a hole to let in air.

This Wittman creation was the only water-cooled airplane present on the entire airport. The mid-wing is very thin and its chord is almost as long as its span. There is no taper whatsoever except slightly at the tip in front elevation, the tip being chopped off, as in the old Farman airplanes. The plane was designed and built by Wittman himself and the workmanship is excellent. When it is in the air it is the smoothest-running plane of them all. In qualifying for the Thompson Race it averaged 276 m.p.h. for two laps around four pylons.

A "Back-yard" Undercarriage

Wittman's smaller ship was an exact replica of his other one except that it had an inverted in-line Menasco C-4-S engine of 363 cu. in. displacement (his other is 1,145 cu. in.), and this, too, beat everything in its class. The chief quality that gave these planes so much speed was undoubtedly their light weight and a dare-devil at the controls.

Wittman's smaller ship also has leaf springs for the landing gear. These, however, project down from the fuselage to the wheels, and one day, while making a forced landing, they tangled with the antenna on a Northrop attack ship and remained with the Northrop as the remainder of the airplane skidded along on its belly. Nowadays the plane has a sheet-steel landing gear which was undoubtedly put on in Wittman's spare time in his back yard. The planes are certainly money-makers for Wittman, and he deserves much credit for having such confidence in his own original ideas.

The U.S. Army Air Corps was represented unofficially in the racing programme by two Seversky low-wing ships that are very much like the Seversky pursuits being delivered to the Army now. One was the original pursuit demonstrator developed by Seversky and now owned by William Zelcer, of New York. It was flown by Seversky's chief test pilot, Frank Sinclair, and was the faster of the two in closed-course racing. However, Frank Fuller, in the other Seversky, was much the

Art Goeble's Boeing 100 sky-writer.